PLUS 8/11/04

Butler, Douglas

From: PLUS
Sent: Monday, August 02, 2004 3:02 PM
To: Butler, Douglas
Subject: PLUS Results for 10750399

Here are the PLUS search results for 10750399.

This search was prepared by the staff of the Scientific and Technical Information Center, SIRA. If you have questions or comments about this search, please reply via email to PLUS@uspto.gov.


10750399_QUAL.txt


10750399_LIST.txt


10750399_WEST.txt


10750399_EAST.txt


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10750399_CLS.txt


10750399_CLSTITLES.txt


10750399_WDS.txt

10750399_LIST

10750399

PLUS Search Results for S/N 10750399, Searched August 02, 2004

The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present. PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

5390947	6230854	6085880
5944147	4896712	3675742
6241052	5303450	3665657
5651430	5449225	3907074
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10750399_CLS
Most Frequently Occurring Classifications of Patents Returned
From A Search of 10750399 on August 02, 2004

Original Classifications

10	188/71.5
8	188/18A
6	188/71.9
4	301/105.1
3	188/73.44
3	301/37.43
2	60/435
2	188/1.11L
2	188/72.4
2	188/72.7
2	188/72.8
2	280/276
2	301/36.1
2	475/86

Cross-Reference Classifications

7	188/18A
6	188/170
4	188/196BA
4	188/196D
4	188/26
4	188/71.5
4	188/72.6
4	188/72.9
4	188/73.45
3	188/106F
3	188/161
3	188/218XL
3	188/71.1
3	188/71.9
3	188/72.3
3	188/74
3	192/111A
3	475/221
3	475/900
2	16/35R
2	60/487
2	60/589
2	60/591
2	74/607
2	180/247
2	188/181R
2	188/196P
2	188/196V
2	188/202
2	188/218A
2	188/24.12
2	188/24.22
2	188/349
2	188/73.31
2	192/107R
2	192/3.51
2	192/45
2	192/48.6

2 192/70.17
2 192/70.19
2 192/70.2
2 244/111
2 251/129.15
2 280/277
2 280/93.512
2 301/105.1
2 301/108.4
2 301/124.1
2 301/35.628
2 301/37.36
2 384/544
2 384/589
2 384/906
2 403/359.2
2 475/150
2 475/159

Combined Classifications
15 188/18A
14 188/71.5
9 188/71.9
7 188/170
6 301/105.1
5 188/196BA
5 188/72.9
5 188/73.45
4 188/196D
4 188/218XL
4 188/26
4 188/72.6
4 188/73.44
4 301/37.43
3 188/106F
3 188/161
3 188/71.1
3 188/72.3
3 188/72.4
3 188/72.7
3 188/73.31
3 188/74
3 192/111A
3 244/111
3 251/129.15
3 301/124.1
3 301/37.36
3 475/221
3 475/900
2 16/35R
2 60/435
2 60/487
2 60/589
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2 74/607
2 180/247
2 180/249
2 188/1.11L
2 188/181R

2 188/196P
2 188/196V
2 188/202
2 188/218A
2 188/24.12
2 188/24.22
2 188/319.2
2 188/344
2 188/349
2 188/71.8
2 188/72.5
2 188/72.8
2 192/104B
2 192/107R
2 192/3.51
2 192/35
2 192/45
2 192/48.6
2 192/70.17
2 192/70.19
2 192/70.2
2 280/276
2 280/277
2 280/93.512
2 301/108.4
2 301/110.5
2 301/35.628
2 301/35.63
2 301/36.1
2 303/9.63
2 384/448
2 384/544
2 384/589
2 384/906
2 403/359.2
2 475/150
2 475/159
2 475/85
2 475/86

10750399_CLSTITLES

Titles of Most Frequently Occurring Classifications of Patents Returned
From A Search of 10750399 on August 02, 2004

15 188/18A (8 OR, 7 XR)
Class 188 : BRAKES
188/2R VEHICLE
188/17 .Hub or disk
188/18R ..Motor vehicle
188/18A ...Disc brakes

14 188/71.5 (10 OR, 4 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor
188/71.5 ..Plural rotating elements (e.g., "multidisc")

9 188/71.9 (6 OR, 3 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor
188/71.7 ..With means to adjust for wear of brake
188/71.8 ...Self-adjusting means
188/71.9 ....Including unidirectionally rotating screw

7 188/170 (1 OR, 6 XR)
Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/166 .Spring
188/170 ..Fluid-pressure release

6 301/105.1 (4 OR, 2 XR)
Class 301 : LAND VEHICLES: WHEELS AND AXLES
301/5.1 WHEEL
301/105.1 .Hub

5 188/196BA (1 OR, 4 XR)
Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/196R .Slack
188/196B ..Ratchet
188/196BA ...Rotatable

5 188/72.9 (1 OR, 4 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor
188/72.1 ..With means for actuating brake element
188/72.9 ...By pivoted lever

5 188/73.45 (1 OR, 4 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing

therefor
188/73.31 ..Retainer for brake element
188/73.43 ...Including actuator slidable in plane parallel to axis of rotation of wheel
188/73.44 ....On axially extending pin
188/73.45 .....Plural pins

4 188/196D (0 OR, 4 XR)
Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/196R .Slack
188/196D ..Frictional rotation

4 188/218XL (1 OR, 3 XR)
Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/218R .Brake wheels
188/218XL ..Disk type

4 188/26 (0 OR, 4 XR)
Class 188 : BRAKES
188/2R VEHICLE
188/24.11 .Velocipede (e.g., bicycle, etc.)
188/26 ..Hub or disk

4 188/72.6 (0 OR, 4 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor
188/72.1 ..With means for actuating brake element
188/72.4 ...By fluid pressure piston
188/72.6 ....And/or mechanical linkage

4 188/73.44 (3 OR, 1 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor
188/73.31 ..Retainer for brake element
188/73.43 ...Including actuator slidable in plane parallel to axis of rotation of wheel
188/73.44 ....On axially extending pin

4 301/37.43 (3 OR, 1 XR)
Class 301 : LAND VEHICLES: WHEELS AND AXLES
301/5.1 WHEEL
301/37.101 .With wheel cover
301/37.42 ..Plastic cover
301/37.43 ...Permanently secured to wheel

3 188/106F (0 OR, 3 XR)
Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/105 .Multiple
188/106R ..Vehicle
188/106F ...Fluid and mechanical

3 188/161 (0 OR, 3 XR)

Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/158 .Electric
188/161 ..Electromagnet

3 188/71.1 (0 OR, 3 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor

3 188/72.3 (0 OR, 3 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor
188/72.1 ..With means for actuating brake element
188/72.3 ...And means for retracting brake element

3 188/72.4 (2 OR, 1 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor
188/72.1 ..With means for actuating brake element
188/72.4 ...By fluid pressure piston

3 188/72.7 (2 OR, 1 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor
188/72.1 ..With means for actuating brake element
188/72.7 ...By inclined surface (e.g., wedge, cam or screw)

3 188/73.31 (1 OR, 2 XR)
Class 188 : BRAKES
188/67 ROD
188/71.1 .Axially movable brake element or housing therefor
188/73.31 ..Retainer for brake element

3 188/74 (0 OR, 3 XR)
Class 188 : BRAKES
188/67 ROD
188/74 .Transversely movable

3 192/111A (0 OR, 3 XR)
Class 192 : CLUTCHES AND POWER-STOP CONTROL
192/30R CLUTCHES
192/111R .Wear compensators
192/111A ..Automatic wear compensators

3 244/111 (1 OR, 2 XR)
Class 244 : AERONAUTICS
244/110R RETARDING AND RESTRAINING DEVICES
244/111 .Wheel brake arrangement

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3  251/129.15     (1 OR, 2 XR)
        Class   251 :  VALVES AND VALVE ACTUATION
        251/129.01    ELECTRICALLY ACTUATED VALVE
        251/129.15    .Including solenoid

3  301/124.1      (1 OR, 2 XR)
        Class   301 :  LAND VEHICLES:  WHEELS AND AXLES
        301/124.1     AXLE

3  301/37.36      (1 OR, 2 XR)
        Class   301 :  LAND VEHICLES:  WHEELS AND AXLES
        301/5.1       WHEEL
        301/37.101    .With wheel cover
        301/37.35     ..Wheel body or rim having integral securing
                         bump
        301/37.36     ...Bump on rim

3  475/221        (0 OR, 3 XR)
        Class   475 :  PLANETARY GEAR TRANSMISSION SYSTEMS OR
                         COMPONENTS
        475/220       DIFFERENTIAL PLANETARY GEARING
        475/221       .Differential or nondifferential planetary
                         combined with differential (e.g., two differentials)

3  475/900        (0 OR, 3 XR)
        Class   475 :  PLANETARY GEAR TRANSMISSION SYSTEMS OR
                         COMPONENTS
        475/900       BRAKE FOR INPUT OR OUTPUT SHAFT

2   16/35R        (0 OR, 2 XR)
        Class   016 :  MISCELLANEOUS HARDWARE
        16/18R        CASTERS
        16/35R        .Locked

2   60/435        (2 OR, 0 XR)
        Class   060 :  POWER PLANTS
        60/325        PRESSURE FLUID SOURCE AND MOTOR
        60/435        .Having a mechanical clutch or brake device in
                         the power train

2   60/487        (0 OR, 2 XR)
        Class   060 :  POWER PLANTS
        60/325        PRESSURE FLUID SOURCE AND MOTOR
        60/487        .Input pump and rotary output motor system
                         having displacement varying type of direction or speed
                         selector

2   60/589        (0 OR, 2 XR)
        Class   060 :  POWER PLANTS
        60/325        PRESSURE FLUID SOURCE AND MOTOR
        60/533        .Pulsator
        60/585        ..Holder for reserve liquid feeds master
        60/589        ...Master piston or its actuator mechanically
                         operates valve between holder and master cylinder

2   60/591        (0 OR, 2 XR)
        Class   060 :  POWER PLANTS
        60/325        PRESSURE FLUID SOURCE AND MOTOR
        60/533        .Pulsator
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60/591 ..Having valve, director, or restrictor in pulse fluid flow path

2 74/607 (0 OR, 2 XR)
Class 074 : MACHINE ELEMENT OR MECHANISM
74/469 CONTROL LEVER AND LINKAGE SYSTEMS
74/606R .Gear casings
74/607 ..Axle and torque tubes

2 180/247 (0 OR, 2 XR)
Class 180 : MOTOR VEHICLES
180/233 HAVING FOUR WHEELS DRIVEN
180/247 .With manually operated means for disengaging drive to one or more, but fewer than all, of the four wheels

2 180/249 (1 OR, 1 XR)
Class 180 : MOTOR VEHICLES
180/233 HAVING FOUR WHEELS DRIVEN
180/248 .With differential means for driving two wheel sets at dissimilar speeds
180/249 ..And means for locking out the differential means

2 188/1.11L (2 OR, 0 XR)
Class 188 : BRAKES
188/1.11R WITH CONDITION INDICATOR
188/1.11W .Wear
188/1.11L ..Electrical

2 188/181R (0 OR, 2 XR)
Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/174 .Weight
188/180 ..Regulators
188/181R ...Vehicle

2 188/196P (0 OR, 2 XR)
Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/196R .Slack
188/196P ..Friction

2 188/196V (0 OR, 2 XR)
Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/196R .Slack
188/196V ..Screw, shim or cam

2 188/202 (0 OR, 2 XR)
Class 188 : BRAKES
188/381 FRICTIONAL VIBRATION DAMPER
188/196R .Slack
188/197 ..Railway car
188/198 ...Automatic
188/202 ....Screw

2 188/218A (0 OR, 2 XR)
Class 188 : BRAKES

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          188/381       FRICTIONAL VIBRATION DAMPER
          188/218R      .Brake wheels
          188/218A      ..Dust guard

  2  188/24.12      (0 OR, 2 XR)
          Class   188 :  BRAKES
          188/2R        VEHICLE
          188/24.11     .Velocipede (e.g., bicycle, etc.)
          188/24.12     ..Including mechanism for opposed gripping of
                           wheel rim or tire

  2  188/24.22      (0 OR, 2 XR)
          Class   188 :  BRAKES
          188/2R        VEHICLE
          188/24.11     .Velocipede (e.g., bicycle, etc.)
          188/24.12     ..Including mechanism for opposed gripping of
                            wheel rim or tire
          188/24.22     ...Specific actuator element structure

  2  188/319.2      (1 OR, 1 XR)
          Class   188 :  BRAKES
          188/266       INTERNAL-RESISTANCE MOTION RETARDER
          188/297       .Having a thrust member with a variable volume
                              chamber (e.g., coaxial or telescoping tubes, compensat
ing
                              reservoir)
          188/316       ..Fluid through or around piston within chamber

          188/317       ...Via fixed or variable orifice in piston
          188/319.2     ....Orifice size varied using a hand or hand
                           tool

  2  188/344        (1 OR, 1 XR)
          Class   188 :  BRAKES
          188/381       FRICTIONAL VIBRATION DAMPER
          188/151R      .Fluid pressure
          188/152       ..Road vehicle
          188/344       ...Velocipede

  2  188/349        (0 OR, 2 XR)
          Class   188 :  BRAKES
          188/381       FRICTIONAL VIBRATION DAMPER
          188/151R      .Fluid pressure
          188/152       ..Road vehicle
          188/349       ...With front rear brake apportioner

  2  188/71.8       (1 OR, 1 XR)
          Class   188 :  BRAKES
          188/67        ROD
          188/71.1      .Axially movable brake element or housing
                             therefor
          188/71.7      ..With means to adjust for wear of brake
          188/71.8      ...Self-adjusting means

  2  188/72.5       (1 OR, 1 XR)
          Class   188 :  BRAKES
          188/67        ROD
          188/71.1      .Axially movable brake element or housing
                              therefor
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        188/72.1      ..With means for actuating brake element
        188/72.4      ...By fluid pressure piston
        188/72.5      ....Piston for each of plural elements

2  188/72.8      (2 OR, 0 XR)
        Class   188 :  BRAKES
        188/67        ROD
        188/71.1      .Axially movable brake element or housing
                            therefor
        188/72.1      ..With means for actuating brake element
        188/72.7      ...By inclined surface (e.g., wedge, cam or
                          screw)
        188/72.8      ....Screw or helical cam

2  192/104B      (1 OR, 1 XR)
        Class   192 :  CLUTCHES AND POWER-STOP CONTROL
        192/30R       CLUTCHES
        192/82R       .Operators
        192/103R      ..Speed responsive
        192/104R      ...Fixed-speed release
        192/104B      ....Transversely engaged-interior

2  192/107R      (0 OR, 2 XR)
        Class   192 :  CLUTCHES AND POWER-STOP CONTROL
        192/30R       CLUTCHES
        192/107R      .Engaging surfaces

2  192/3.51      (0 OR, 2 XR)
        Class   192 :  CLUTCHES AND POWER-STOP CONTROL
        192/3.51      TRANSMISSION CONTROL AND CLUTCH CONTROL

2  192/35        (1 OR, 1 XR)
        Class   192 :  CLUTCHES AND POWER-STOP CONTROL
        192/30R       CLUTCHES
        192/31        .Automatic
        192/32        ..Manual control
        192/35        ...Pilot mechanism

2  192/45        (0 OR, 2 XR)
        Class   192 :  CLUTCHES AND POWER-STOP CONTROL
        192/30R       CLUTCHES
        192/31        .Automatic
        192/41R       ..One-way engaging
        192/45        ...Ball or roller

2  192/48.6      (0 OR, 2 XR)
        Class   192 :  CLUTCHES AND POWER-STOP CONTROL
        192/30R       CLUTCHES
        192/48.1      .Plural clutch-assemblage
        192/48.3      ..Diverse clutch-assemblages
        192/48.5      ...Including one clutch-assemblage having
                          interdigitated clutch-elements
        192/48.6      ....And another clutch-assemblage having
                         unirotationally engaging clutch elements

2  192/70.17     (0 OR, 2 XR)
        Class   192 :  CLUTCHES AND POWER-STOP CONTROL
        192/30R       CLUTCHES
        192/66.1      .Axially engaging
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        192/70.11      ..Interposed, mating clutch-elements
        192/70.16      ...With torque connection between
                           clutch-element and its shaft
        192/70.17      ....Resilient torque connection (e.g., for
                           damping vibration)

2  192/70.19      (0 OR, 2 XR)
        Class   192 :  CLUTCHES AND POWER-STOP CONTROL
        192/30R        CLUTCHES
        192/66.1       .Axially engaging
        192/70.11      ..Interposed, mating clutch-elements
        192/70.16      ...With torque connection between
                           clutch-element and its shaft
        192/70.19      ....Axially slidable connection

2  192/70.2       (0 OR, 2 XR)
        Class   192 :  CLUTCHES AND POWER-STOP CONTROL
        192/30R        CLUTCHES
        192/66.1       .Axially engaging
        192/70.11      ..Interposed, mating clutch-elements
        192/70.16      ...With torque connection between
                           clutch-element and its shaft
        192/70.19      ....Axially slidable connection
        192/70.2       .....Spline connection for multiple
                           clutch-elements

2  280/276        (2 OR, 0 XR)
        Class   280 :  LAND VEHICLES
        280/29         WHEELED
        280/200        .Occupant propelled type
        280/263        ..With steering
        280/270        ...One-wheel controlled
        280/274        ....Frames and running gear
        280/275        .....Yielding
        280/276        ......Front forks and heads

2  280/277        (0 OR, 2 XR)
        Class   280 :  LAND VEHICLES
        280/29         WHEELED
        280/200        .Occupant propelled type
        280/263        ..With steering
        280/270        ...One-wheel controlled
        280/274        ....Frames and running gear
        280/275        .....Yielding
        280/276        ......Front forks and heads
        280/277        .......Independent wheel mounting

2  280/93.512     (0 OR, 2 XR)
        Class   280 :  LAND VEHICLES
        280/29         WHEELED
        280/80.1       .Running gear
        280/771        ..Occupant steered
        280/93.502     ...Linkage
        280/93.512     ....Kingpin, steering knuckle, steering arm, or
                           wheel carrier construction

2  301/108.4      (0 OR, 2 XR)
        Class   301 :  LAND VEHICLES:  WHEELS AND AXLES
        301/5.1        WHEEL
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301/105.1 .Hub
301/108.1 ..Hub cap
301/108.4 ...Retained by threaded means

2 301/110.5 (1 OR, 1 XR)
Class 301 : LAND VEHICLES: WHEELS AND AXLES
301/5.1 WHEEL
301/105.1 .Hub
301/110.5 ..For cycle-type vehicle

2 301/35.628 (0 OR, 2 XR)
Class 301 : LAND VEHICLES: WHEELS AND AXLES
301/5.1 WHEEL
301/9.1 .Detachable wheel section
301/35.628 ..Dual wheel coupling

2 301/35.63 (1 OR, 1 XR)
Class 301 : LAND VEHICLES: WHEELS AND AXLES
301/5.1 WHEEL
301/9.1 .Detachable wheel section
301/35.621 ..Disc wheel bolted to hub
301/35.63 ...By central nut

2 301/36.1 (2 OR, 0 XR)
Class 301 : LAND VEHICLES: WHEELS AND AXLES
301/5.1 WHEEL
301/36.1 .Dual wheels

2 303/9.63 (1 OR, 1 XR)
Class 303 : FLUID-PRESSURE AND ANALOGOUS BRAKE SYSTEMS
303/5 MULTIPLE FLUID-RECEIVING DEVICES
303/6.01 .Multiple motors
303/9.62 ..Apportioning control
303/9.63 ...Failure responsive

2 384/448 (1 OR, 1 XR)
Class 384 : BEARINGS
384/91 ROTARY BEARING
384/445 .Antifriction bearing
384/448 ..Sensor or inspection features; liquid metal or shipping protection features; bearing member integral with seal

2 384/544 (0 OR, 2 XR)
Class 384 : BEARINGS
384/91 ROTARY BEARING
384/445 .Antifriction bearing
384/456 ..Radial bearing
384/490 ...Ball bearing
384/543 ....Fixed shaft and rotating outer member
384/544 .....For hub

2 384/589 (0 OR, 2 XR)
Class 384 : BEARINGS
384/91 ROTARY BEARING
384/445 .Antifriction bearing
384/456 ..Radial bearing
384/548 ...Roller bearing
384/586 ....Fixed shaft and rotating outer member

384/589 .....For hub

2 384/906 (0 OR, 2 XR)
Class 384 : BEARINGS
384/900 COOLING OR HEATING
384/906 .Antirotation key

2 403/359.2 (0 OR, 2 XR)
Class 403 : JOINTS AND CONNECTIONS
403/345 INTERFITTED MEMBERS
403/359.1 .Longitudinally splined or fluted rod
403/359.2 ..Splayed or having a cam surface for anti-backlash

2 475/150 (0 OR, 2 XR)
Class 475 : PLANETARY GEAR TRANSMISSION SYSTEMS OR COMPONENTS
475/149 ELECTRIC OR MAGNETIC DRIVE OR CONTROL
475/150 .Differential drive or control

2 475/159 (0 OR, 2 XR)
Class 475 : PLANETARY GEAR TRANSMISSION SYSTEMS OR COMPONENTS
475/159 WITH LUBRICATON

2 475/85 (1 OR, 1 XR)
Class 475 : PLANETARY GEAR TRANSMISSION SYSTEMS OR COMPONENTS
475/31 FLUID DRIVE OR CONTROL OF PLANETARY GEARING
475/84 .Control of differential planetary gearing
475/85 ..Special fluid

2 475/86 (2 OR, 0 XR)
Class 475 : PLANETARY GEAR TRANSMISSION SYSTEMS OR COMPONENTS
475/31 FLUID DRIVE OR CONTROL OF PLANETARY GEARING
475/84 .Control of differential planetary gearing
475/86 ..By fluid operated mechanical clutch

EAST 8/11/04

L Number	Hits	Search Text	DB	Time stamp
7	35	("2724252" | "2737033" | "2764261" | "3146860" | "3191735" | "3233704" | "3754624" | "3837420" | "3844385" | "3915272" | "4026393" | "4256209" | "4479569" | "4534457" | "4576255" | "4673065" | "4699254" | "4844206" | "4863000" | "4865160" | "5005676" | "5358079" | "5402865" | "5437351" | "5674026" | "6056089" | "6131932" | "6223863" | "6244391" | "6247560" | "6298953" | "6305510" | "6467588" | "6484852" | "6520296" | "2002/0066625").PN.	USPAT	2004/08/11 08:32
8	1072	188/18a,71.5.ccls. or 301/6.8.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 08:36
9	169	(188/18a,71.5.ccls. or 301/6.8.ccls.) and hub same axle same brak$	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 08:37
10	30	(188/18a,71.5.ccls. or 301/6.8.ccls.) and hub same axle same brak$ same wheel near4 flange	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 08:37
12	321	hub same axle same brak$ and wheel near4 flange same brak$4	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 08:45
11	42	(188/18a,71.5.ccls. or 301/6.8.ccls.) and hub same axle same brak$ and wheel near4 flange same brak$4	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 08:38
13	15	("2412432" | "4948437" | "5107966" | "5109960" | "5540303" | "5568846" | "5620042" | "5823303" | "5864935" | "6032768" | "6073735" | "6095291" | "6139215" | "6152270" | "6267209").PN.	USPAT	2004/08/11 08:39
14	54	hub same axle same brak$ and wheel near4 flange same brak$4	EPO; JPO; DERWENT	2004/08/11 08:40
15	267	hub same axle same brak$ and wheel near4 flange same brak$4	USPAT; US-PGPUB	2004/08/11 08:48
16	184	hub same axle same brak$ and wheel near4 flange same brak$4 and (188/$.ccls. or 384/$.ccls. or 301/$.ccls.)	USPAT; US-PGPUB	2004/08/11 08:49
18	153	hub same axle same brak$ and wheel near4 flange same brak$4 and (188/$.ccls. or 384/$.ccls. or 301/$.ccls.) and (disk or disc or rotor) with brak$4	USPAT; US-PGPUB	2004/08/11 08:51
-	18	Gripemark.in.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:17
-	218	(267/165).CCLS.	USPAT; US-PGPUB	2004/08/10 10:49
-	12	267/165.ccls. and 74/$.ccls.	USPAT; US-PGPUB	2004/08/10 10:56
-	986	267/$.ccls. and 74/$.ccls.	USPAT; US-PGPUB	2004/08/10 10:57
-	1	("5205380").PN.	USPAT; US-PGPUB	2004/08/10 11:25
-	2	haldex.asn. and sleeve same hub same (disk or disk) adj brak$4	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/10 12:21
-	89	sleeve same hub same (disk or disk) adj brak$4	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/10 12:28
-	140	wheel near6 flange same hub same (disk or disk) adj brak$4	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/10 13:30

-	9	wheel near6 flange same hub same (disk or disk) adj brak$4 and hub near5 sleeve	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/10 12:29
-	1	("6766885").PN.	USPAT; US-PGPUB	2004/08/10 13:22
-	58	wheel same hub same (disk or disk) adj brak$4 same spline$3	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/10 13:51
-	1	2003-449928.NRAN.	DERWENT	2004/08/10 13:34
-	0	wo0345712	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/10 13:35
-	0	wo03045712	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/10 13:35
-	5	(("5540303") or ("5507367") or ("5988324") or ("6145632") or ("5590967")).PN.	USPAT; US-PGPUB	2004/08/10 13:45
-	3	5540303.URPN.	USPAT	2004/08/10 13:42

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-	513	hub same (disk or disk) adj brak$4 same axle	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/10 13:52
-	44	hub same (disk or disk) adj brak$4 same axle same wheel near5 rim	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/10 13:52
-	9	Gripemark.in. and hub	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:18
-	0	Gripemark.in. and hub same sleeve	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:18
-	0	Gripemark.in. and hub and sleeve	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:25
-	629	188/18a,71.5,218xl.ccls. and hub same brak$4	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:26
-	99	188/18a,71.5,218xl.ccls. and hub same brak$4 same groove	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:26
-	44	188/18a,71.5,218xl.ccls. and hub same brak$4 and (fixed or stationary) adj2 caliper	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:34
-	424	188/18a,71.5,218xl.ccls. and hub same brak$4 same wheel	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:34
-	193	188/18a,71.5,218xl.ccls. and hub same brak$4 same wheel same axle	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:35
-	36	301/$.ccls. and hub same brak$4 same wheel same axle same (key or keyed or spline or splined)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 08:34
-	37	188/18a,71.5,218xl.ccls. and hub same brak$4 same wheel same axle same (key or keyed or spline or splined)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:38
-	216	hub same brak$4 same wheel same axle same (key or keyed or spline or splined)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:39
-	106	hub same brak$4 same wheel same axle same (key or keyed or spline or splined) same brak$4 near3 (rotor or disk or disc)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/08/11 07:39
-	0	6330937.URPN.	USPAT	2004/08/11 07:47
-	5	("3860095" | "4186824" | "5507367" | "5540303" | "5568846").PN.	USPAT	2004/08/11 07:47

PRV

PATENT- OCH REGISTRERINGSVERKET
Patentavdelningen

PCT/ SE 02/ 01294

Intyg
Certificate

Härmed intygas att bifogade kopior överensstämmer med de handlingar som ursprungligen ingivits till Patent- och registreringsverket i nedannämnda ansökan.

This is to certify that the annexed is a true copy of the documents as originally filed with the Patent- and Registration Office in connection with the following patent application.

(71) *Sökande* *Haldex Brake Products AB, Landskrona SE*
Applicant (s)

(21) *Patentansökningsnummer* *0102350-6*
Patent application number

(86) *Ingivningsdatum* *2001-07-02*
Date of filing

Stockholm, 2002-07-09

För Patent- och registreringsverket
For the Patent- and Registration Office

Lina Oljeqvist

Lina Oljeqvist

Avgift
Fee

PRIORITY DOCUMENT
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APPLICANT: HALDEX BRAKE PRODUCTS AB

TITLE: SLEEVE FOR A DISC BRAKE

Technical Field

The present invention concerns a sleeve for use at a disc brake. The invention is developed for use with brakes for trucks, lorries, busses, trailers or the like, but a person skilled in the art realises that it may be used for any kind of vehicle.

Prior Art

The present invention is intended for use with disc brakes having a fixed caliper. In disc brakes having a fixed caliper one or more brake discs are normally arranged rotatably fixed but axially slideable in relation to the wheel axle. The brake disc is connected to the wheel axle by means of intermediary parts. The intermediary parts are also connected to the wheel flange. In the prior art the number of intermediary parts is often rather high. In view of reducing the complexity and the size of the brake there is a need for a reduced number of intermediary parts. The present invention is directed to said intermediary parts between the brake disc and the wheel axle.

Regarding maintenance one object is that it should be as few steps as possible to replace a brake disc. In the prior art the intermediary parts often comprise a flange disc or a part partly formed as a disc to be attached to the actual wheel flange. If the brake disc is to be replaced the flange disc or the part formed as a disc has to be removed before the disc could be replaced. Thus, one has to go through several steps when replacing a disc brake according to the prior art.

A further problem is that the heat produced during breaking may be quite substantial. Thus, there is a need

for means at the intermediary parts, to protect different parts of the brake and axle against overheating.

The Invention

One object of the present invention is to arrange the intermediary parts in such a way that a cooling effect is created. The cooling effect is mainly to protect bearing means being part of the intermediary parts. It may also be necessary to protect other parts, such as sensors against overheating.

The above object is met by a sleeve for a disc brake, which sleeve has means for co-operation with at least one brake disc. The sleeve is to be received on a wheel axle. Furthermore, the sleeve has a groove, the main orientation of which being parallel with the outer periphery of the sleeve.

A further object of the present invention is to facilitate maintenance of the disc brakes and especially to facilitate replacement of the brake disc.

Still a further object of the present invention is to reduce the number of parts used for connecting, directly or indirectly, a brake disc to a wheel axle and wheel flange, respectively.

The integrated sleeve and hub of the present invention reduce the number of intermediary parts between the wheel axle and the wheel flange from four to two.

Further objects and advantages of the present invention will be obvious for a person skilled in the art when reading the detailed description below of a preferred embodiment.

Brief Description of the Drawings

The present invention will be described more closely below with reference to a preferred embodiment, by way of

an example, and with further reference to the enclosed drawings. In the drawings,

Fig. 1 is a perspective view, partly in section of a sleeve according to the present invention fixed to a wheel flange,

Fig. 2 is a perspective view of the sleeve of Fig. 1, and

Fig. 3 is a perspective view, partly in section, of the sleeve of Figs. 1 and 2 taken from the opposite direction.

Detailed Description of a Preferred Embodiment

The integrated sleeve 2 of the present invention corresponds to a sleeve and hub, normally present at disc brakes of the prior art.

According to the present invention the integrated sleeve 2 is attached directly to a wheel flange 1. Thus, the wheel flange 1 has to be made strong and stiff enough to carry the sleeve 2 of the disc brake. In the shown embodiment the sleeve 2 is attached to the wheel flange 1 by means of a number of bolts 3. In the shown embodiment there are twelve bolts 3, but a person skilled in the art realises that the number of bolts may be different in other embodiments. The bolts 3 are received in threaded openings of the sleeve 2. The threaded openings of the sleeve 2 are arranged on the end of the sleeve 2 intended for contact with the wheel flange 1. The threaded openings of the sleeve 2 are adapted to corresponding openings in the wheel flange 1.

The integrated sleeve 2 is to be placed on the wheel axle. The inner periphery of the sleeve 2 is received on the wheel axle by way of a bearing means (not shown).

The sleeve 2 is to support one or more brake discs (not shown) by way of means for co-operation with corresponding means of the brake disc(s). In the shown embodi-

ment the means for co-operation with the brake disc(s) is splines. The splines have the form of raised portions 4 and grooves 5 arranged on the outer periphery of the sleeve 2. The actual cross-sectional form of the splines may vary between different embodiments. The splines of the sleeve 2 are to co-operate with corresponding parts of the brake disc(s). The brake disc(s) is received rotatably fixed to the sleeve 2 but moveable in an axial direction.

The outer periphery of the raised portions 4 and grooves 5, forming the splines of the sleeve 2, is straight and parallel with the main extent of the wheel axle. Expressed differently the sleeve 2 has a generally tubular form. The outer form of the sleeve 2 permits a brake disc to be slid off or onto the sleeve 2 in any axial direction.

A groove 6 is arranged in the sleeve 2, which groove is open towards one end of the sleeve 2. The groove 6 is parallel with the outer periphery of the sleeve 2 and is open in the direction away from the wheel flange 1. Thus, the groove 6 does not extend all the way to the end of the sleeve 2 to be attached to the wheel flange 1. By the groove 6 an inner wall 7 is formed at the inner periphery of the sleeve 2. The inner wall 7 has a shorter axial extension directed away from the wheel flange 1 than the outer wall of the sleeve 2.

At the open end of the groove 6, i.e. the end directed away from the wheel flange 1, a number of bridges 8 connect the inner wall 7 to the outer wall of the sleeve 2. The bridges 8 have a stiffening effect. The purpose of the groove 6 is to protect the bearing means placed between the inner wall 7 of the sleeve and the wheel axle against overheating. It is especially the grease of the bearing means that is in the risk of being overheated.

By the form and placement of the integrated sleeve 2 it is fairly simple to replace the brake disc. To replace the brake disc the bolts 3 are first unscrewed and the

wheel with the wheel flange 1 is lifted off. When the wheel has been lifted off the brake disc(s) may be slid on the splines 4,5 of the sleeve 2 out off the sleeve 2. Then a new brake disc may be slid back onto the splines 4,5 of the sleeve 2 and the wheel flange 1 is then fixed to the sleeve 2.

CLAIMS

1. A sleeve (2) for a disc brake, which sleeve (2) has means (4,5) for co-operation with at least one brake disc, and which sleeve (2) is to be placed on a wheel axle, **characterized** in that the sleeve (2) has a groove (6), the main orientation of said groove (6) being parallel with the outer periphery of the sleeve (2).

2. The sleeve (2) of claim 1, **characterized** in that the groove (6) is open towards one end of the sleeve (2) and that the groove (6) forms an inner wall (7), which inner wall (7) is parallel with the outer periphery of the sleeve (2).

3. The sleeve (2) of claim 2, **characterized** in that a number of bridges (8) is arranged between the inner wall (7) and the rest of the sleeve (2), which bridges (8) are arranged in connection with the open end of the groove (6).

4. The sleeve (2) of any of the previous claims, **characterized** in that bearing means are arranged between the inner wall (7) of the sleeve (2) and the wheel axle

5. The sleeve (2) of claim 4, **characterized** in that the groove (6) has a cooling effect on the bearing means.

6. The sleeve (2) of any of the previous claims, **characterized** in that the means for co-operation with the brake disc is splines (4,5).

7. The sleeve (2) of any of the previous claims, **characterized** in that the sleeve (2) is attached directly to a wheel flange (1).

8. The sleeve (2) of claim 7, **characterized** in that the groove (6) is open in the direction directed away from the wheel flange (1).

9. The sleeve (2) of claim 7 or 8, **characterized** in that the sleeve (2) has threaded openings for receiving bolts (3), used to securely screw the sleeve (2) onto the wheel flange (1) and that the wheel flange (1) has openings corresponding to the threaded openings of the sleeve (2).

10. The sleeve (2) of any of the previous claims, **characterized** in that the sleeve (2) has a generally tubular form, where the outer periphery of the sleeve (2) is generally straight and parallel with the main extent of the wheel axle, allowing a brake disc to be slid off or slid onto the sleeve (2) in any axial direction.

ABSTRACT

The present invention concerns a sleeve (2) for a disc brake. The sleeve (2) is furnished with splines (4,5) on the outer periphery for co-operation with one or more brake discs. The sleeve (2) is to be placed on a wheel axle and is attached to a wheel flange 1 by means of a number of bolts 3 received in threaded openings of the sleeve (2). A groove (6) is arranged in the sleeve (2), which groove (6) is parallel with the outer periphery of the sleeve (2) and is open at one end. The sleeve (2) has a generally straight outer periphery allowing the brake disc(s) to be slid off and slid onto the sleeve (2) in any axial direction.

To be published with Fig. 1

PRV 01-07-02 M

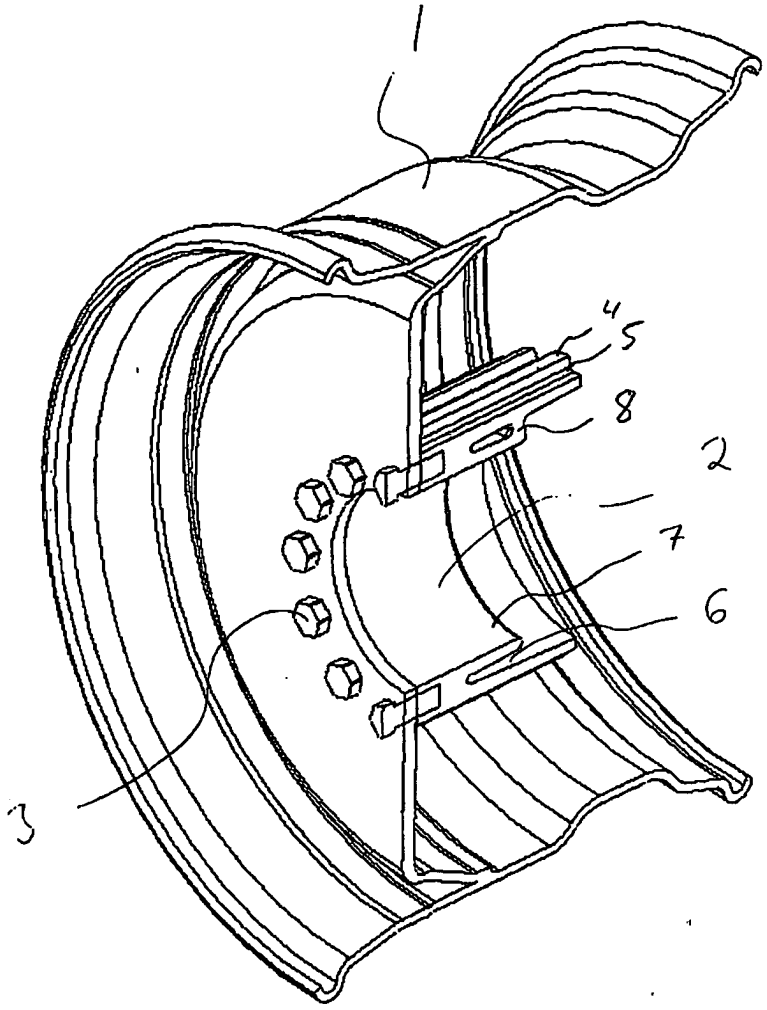

Fig. 1

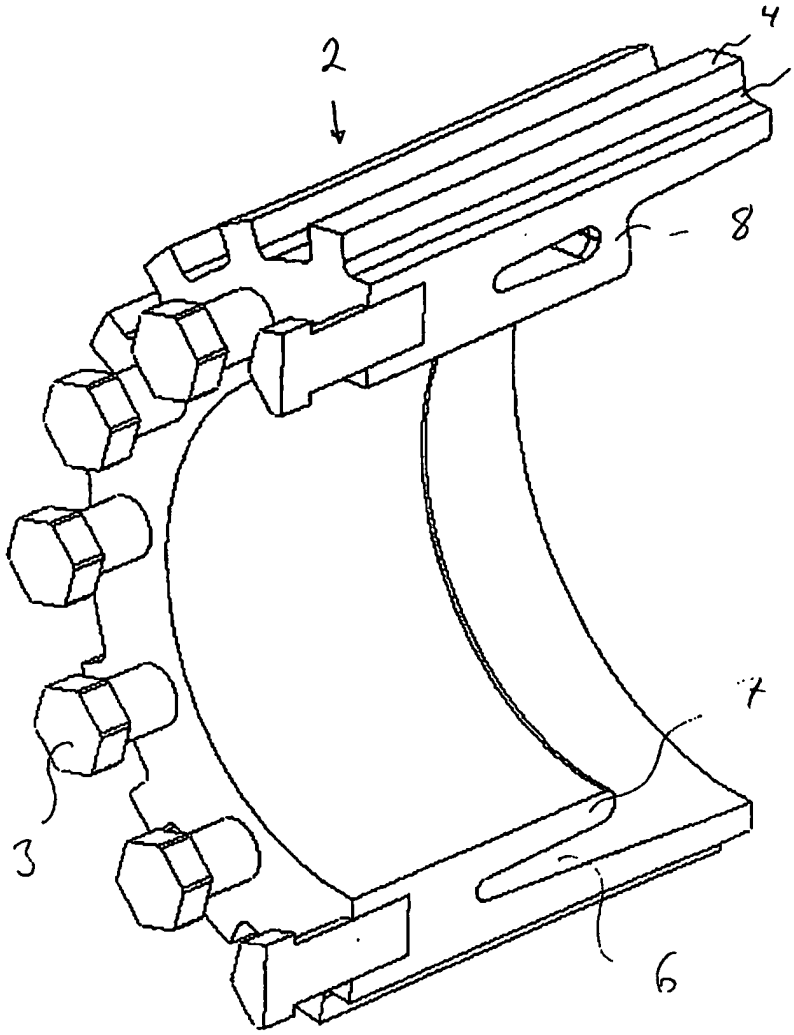

Fig. 2

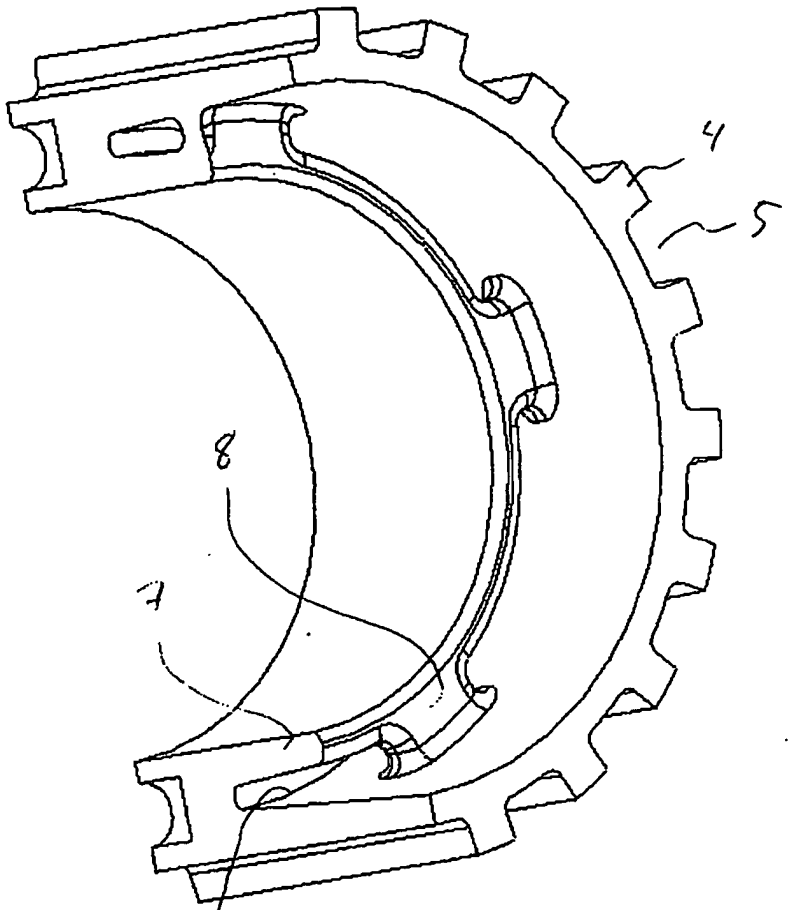

Fig 3

Enter application number: [ ] or

(e.g. 99203729 or EP19990402065 or WO1998US04141)

Enter publication number: [ ]

(e.g. EP1023455 or WO0133678)

Applications viewed: [...]

European Patent Register

Date	Documents for publication number WO03004895	Procedure	Pages
2004-06-22	Final instructions in case of ADWI/REFU	Search/Exam	1
2004-06-09	Priority document (electronically filed)	Search/Exam	12
2004-03-12	FFEE/SFEE/DEST/EXAM not paid, TRAN not filed/ADWI	Search/Exam	4
2003-11-21	Info.on entry into regional phase (pages 1-2)	Search/Exam	3
2003-10-24	Copy of the International preliminary examination report	Search/Exam	4
2003-10-24	Amendments attached to the international preliminary examination report	Search/Exam	4
2003-01-16	International publication pamphlet	Search/Exam	12
2003-01-16	Copy of the International Search report	Search/Exam	3
Date	Documents for publication number WO03004895	Procedure	Pages